

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Application No. 09/980,713

REMARKS

Claims 1-8 are all the claims pending in the application. Claim 1 is rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Claims 1 and 8 are rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Maruo et al. (U.S. Patent No. 6,091,219), hereinafter referred to as Maruo. Claims 2-5 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Maruo as applied to claim 1, in view of Philipp (U.S. Patent No. 6,025,683). Claim 6 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Maruo as applied to claim 1, and further in view of Sawashima et al. (U.S. Patent No. 6,008,609). Finally, claim 7 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Maruo as applied to claim 1, in view of Sawashima, and further in view of Takaki et al. (U.S. Patent No. 6,081,090), hereinafter referred to as Takaki.

§ 112, second paragraph, Rejection - Claim 1

The Examiner rejects claim 1 for the reasons set forth on page 2 of the Office Action. Applicant amends claim 1, as indicated herein, and submits that this amendment obviates the § 112 rejection of claim 1. Further, Applicant submits that one skilled in the art would understand that "motor drive currents" and "motor speeds" input from the drive units are part of the claimed invention, as a motor drive current and motor speed are values or signals that are known aspects of a numerical control system.

§ 102(e) Rejections (Maruo) - Claims 1 and 8

The Examiner rejects claims 1 and 8 under § 102(e) for the reasons set forth on pages 3 and 4 of the Office Action. In response, Applicant traverses these rejections at least for the reasons set forth below.

To anticipate a claim, an applied reference must teach or suggest each and every limitation of the claimed invention.

With respect to independent claim 1, Applicant submits that Maruo does not teach or suggest at least “input current detection means for finding an input current of the AC power supplied from the AC power supply” and “input current determination means for comparing the input current found by the input current detection means with an allowable current value...”. That is, to support the Examiner’s assertion that these above-quoted limitations are disclosed in Maruo, the Examiner only cites column 5, lines 60-67 of Maruo. However, these cited portions of Maruo only disclose that one revolution counter 72 and a multirevolution counter 73 are both connected to an alarm circuit 74 which detects a failure in operation of each of the one revolution counter 72 and the multirevolution counter 73. Further, these cited portions of Maruo also indicate that a power monitor 75 monitors the dc power supplied from a DC/DC converter. However, there is no mention of “finding an input current of the AC power supplied from the AC power supply.” Yet further, there is no mention of comparing an input current of an AC power with an allowable current value. Maruo only mentions outputting an alarm signal when the dc power exhibits an abnormal condition, but it does not mention comparing an input current of an AC power with an allowable current value. Therefore, for at least the above stated reasons, Applicant submits that independent claim 1 is patentably distinguishable over Maruo.

Applicant submits that dependent claim 8 is patentable at least by virtue of its dependency from independent claim 1. Further, with respect to claim 8, Applicant submits that nowhere does Maruo teach or suggest that "said motor drive power converter comprises input current output means for outputting the input current found by the input current detection means to said numerical control unit," as recited in claim 8. That is, nowhere does Maruo even discuss outputting input current found by the input current detection means to a numerical control unit. Element number 46 of Fig. 3, which allegedly corresponds to the claims "input current output means," does not output input current to a numerical control unit. Therefore, at least based on the foregoing, Applicant submits that dependent claim 8 is patentable over the applied reference.

§ 103(a) Rejections (Maruo / Philipp) - Claims 2-5

Dependent claims 2-5 are rejected under 35 U.S.C. § 103(a) for the reasons set forth on pages 4-5 of the Office Action. The Examiner admits that Maruo does not teach the respective limitations of claim 2-5, however the Examiner alleges that Philipp discloses the limitations of these claims.

In response, Applicant submits that dependent claims 2-5 are patentable at least by virtue of their respective dependencies from independent claim 1. Philipp does not make up for the deficiencies of Maruo.

§ 103(a) Rejection (Maruo / Sawashima) - Claim 6

Dependent claim 6 is rejected under 35 U.S.C. § 103(a) for the reasons set forth on pages 5 and 6 of the Office Action. The Examiner alleges that Maruo teaches all of the limitations of claim 6, including a motor drive power converter comprising phase detection means for detecting a power supply phase of AC power. The Examiner, however, admits that Maruo does not teach

or suggest input current determination means, but alleges that Sawashima makes up for the deficiencies of Maruo.

In response, first, Applicant submits that dependent claim 6 is patentable at least by virtue of its dependency from independent claim 1. Sawashima does not make up for the deficiencies of Maruo.

Further, in rejecting claim 1, the Examiner appears to allege that element #56 of Fig. 2 (of Maruo) corresponds to the claimed motor driver power converter. *See numbered paragraph 5, lines 7-9.* In rejecting claim 6, the Examiner now alleges that element #41 of Fig. 2 corresponds to the claimed phase detection means. Thus, based on these arguments of the Examiner, the applied references clearly do not satisfy the limitations of claim 6, as claim 6 recites, in part, that "said motor drive power converter comprises phase detection means...". Element #56 (dc power circuit) of Maruo, which allegedly corresponds to the claimed motor drive power converter, clearly does not comprise element #41 of Maruo. Therefore, at least based on the foregoing, Applicant submits that dependent claim 6 is patentably distinguishable over the applied references.

Yet further, with respect to dependent claim 6, nowhere does Sawashima teach or suggest the specific limitations recited in claim 6. That is, the portion of Sawashima cited by the Examiner discusses only the rotational speed of a spindle instructed by a machining program in relation to a spindle rotational speed value for a fourth stage, but does not discuss at least that "the input current determination means inputs the power supply phase detected by the phase detection means and compares the input current with the allowable current value with respect to the less-than, equal-to, or greater-than relation in the proximity of the power supply phase where

the input current changes in direction," as recited in claim 6. Therefore, for at least the above-stated reasons, Applicant submits that dependent claim 6 is patentably distinguishable over the applied references.

§ 103(a) Rejection (Maruo / Sawashima / Takaki) - Claim 7

The Examiner rejects claim 7 under 35 U.S.C. § 103(a) for the reasons set forth on pages 6 and 7 of the Office Action. Applicant traverses this rejection at least for the following reasons.

First, Applicant submits that dependent claim 7 is patentable at least by virtue of its dependency from independent claim 1. Neither Sawashima nor Takaki makes up for the deficiencies of Maruo.

Further, with respect to claim 7, the Examiner alleges that Fig. 19 of Sawashima satisfies the claim limitation "wherein said motor driver power converter comprises cumulative-sum-of-times retention means for retaining the cumulative sum of times the input current determination means has determined that the input current exceeds the allowable current value," as recited in claim 7. However, Fig. 19 of Sawashima only illustrates a table for storing spindle acceleration/deceleration pattern data, but does not illustrate or suggest the above-quoted limitations of claim 7. Therefore, at least based on the foregoing, Applicant submits that claim 7 is patentably distinguishable over the applied references.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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Respectfully submitted,

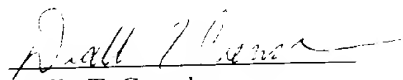
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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims are amended as follows:

1. (Twice Amended) A numerical control drive system having two or more drive units ~~consisting of~~, said numerical control drive system comprising a servo drive unit for driving a motor, a spindle drive unit, ~~etc.~~, a numerical control unit for outputting a control command for driving the motor to said two or more drive units, and a motor drive power converter for converting AC power supplied from an AC power supply into DC power and supplying the DC power to said two or more drive units, ~~characterized in that~~ wherein said motor drive power converter comprises input current detection means for finding an input current of the AC power supplied from the AC power supply, input current determination means for comparing the input current found by the input current detection means with an allowable current value with respect to at least one of a less-than, equal-to, ~~or~~ and greater-than relation, and control signal output means for inputting at least ~~either one of~~ one of motor drive currents or motor speeds from said two or more drive units to which the DC power is supplied, selecting the drive unit providing a large effect of lowering the input current, and outputting a control signal thereto if the input current determination means determines that the input current is greater than the allowable current value, ~~that~~ wherein said drive unit comprises control signal execution means for changing the control command from said numerical control unit based on the control signal output from the control signal output means, and ~~that~~ wherein the control signal execution means of said drive unit

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inputting the control signal changes the control command from said numerical control unit,
thereby lowering the input current.